### COMMENTARY

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# Vaccine hesitancy in the era of COVID-19: could lessons from the past help in divining the future?

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#### ABSTRACT

Vaccine hesitancy, which embodies the unwillingness to receive vaccines when vaccination services are available and accessible, is one of the greatest threats to global health. Although vaccine hesitancy has existed among a small percentage of people for centuries, its harmful effects are likely to be more pronounced during the COVID-19 pandemic than ever before. COVID-19 vaccine hesitancy will pose substantial risks for both people who delay or refuse to be vaccinated and the wider community. It will make communities unable to reach thresholds of coverage necessary for herd immunity against COVID-19, thus unnecessarily perpetuating the pandemic and resulting in untold suffering and deaths. Vaccine hesitancy is pervasive, misinformed, contagious, and is not limited to COVID-19 vaccination. Our work shows that vaccine hesitancy is a complex and dynamic social process that reflects multiple webs of influence, meaning, and logic. People's vaccination views and practices usually comprise an ongoing engagement that is contingent on unfolding personal and social circumstances, which can potentially change over time. Therefore, as COVID-19 vaccination rolls out globally, scientists and decision-makers need to investigate the scale and determinants of vaccine hesitancy in each setting; so that tailored and targeted strategies can be developed to address it.

It is easy to forget that diseases like smallpox, polio, yellow fever, and others, used to cause millions of deaths and disabilities in many parts of the world that are now (virtually) free of these diseases; largely thanks to vaccination.<sup>1-4</sup> Vaccines could have a similar impact on the coronavirus disease 2019 (COVID-19) pandemic, if there is optimal and equitable uptake of COVID-19 vaccines worldwide. In May 2020, the 73rd World Health Assembly (WHA) issued a resolution recognizing "the role of extensive immunization against COVID-19 as a global public good for health in preventing, containing and stopping transmission in order to bring the pandemic to an end, once safe, quality, efficacious, effective, accessible and affordable vaccines are available"<sup>5</sup> Rapid rollout of COVID-19 vaccination will fast-track the world's return to normality.

However, a survey conducted in July-August 2020 shows that 36% of South Africans are reluctant to be vaccinated against COVID-19.<sup>6</sup> This figure varies widely across countries in Africa, from 6% in Ethiopia to 41% in the Democratic Republic of Congo.<sup>7</sup> The most frequently mentioned reason for not taking the COVID-19 vaccine was lack of confidence in the safety of the vaccines, followed by lack of confidence in the effectiveness of the vaccine, complacency regarding the individual risk of getting infected with COVID-19, and lack of time to go and get a vaccine.<sup>6</sup> Reluctance to accept vaccination is not limited to COVID-19 vaccines. There is an increasing number

of people who are unwilling to take recommended vaccinations,<sup>8-11</sup> a phenomenon referred to as vaccine hesitancy.<sup>12</sup> Doubts regarding the importance and safety of vaccines among a portion of the public have existed since the beginning of vaccination. Yet there is evidence to suggest that vaccine hesitancy trends have become more acute in recent years.<sup>8-10,12</sup> In addition, discussions regarding vaccination in this day and age are increasingly complex as more vaccines are introduced into national immunization programs.<sup>12-14</sup>

The speed of global information exchange has been significantly boosted by social media, leading to viral sharing of fringe opinions and disinformation.<sup>8,9</sup> It is thus hard for the public to tell whether something is an established fact, and truth is lost in noise. The World Health Organization (WHO) Director-General described this very aptly in February 2020, when he said of COVID-19 before it became a pandemic, "We're not just fighting an epidemic; we're fighting an infodemic"<sup>15</sup> An infodemic refers to an excess of information, some correct and some not, which arises during a disease outbreak. It spreads across populations in a similar manner to a disease outbreak,<sup>16</sup> via digital and physical information systems, making it difficult for people to access reliable information when they need it.<sup>15,16</sup> The creation of uncertainty is particularly harmful when it comes to vaccination, because doubt causes vaccine hesitancy.9

**ARTICLE HISTORY** Received 28 January 2021 Accepted 16 February 2021

#### **KEYWORDS**

Vaccine hesitancy; vaccine confidence: vaccine acceptance; vaccination coverage; herd immunity; Africa; COVID-19 vaccination

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Research conducted in high-income countries suggests that there are five main individual-level determinants of vaccine hesitancy: confidence, complacency, convenience (or constraints), risk calculation, and collective responsibility.<sup>11,13</sup> This framework is referred to as the 5 C model of the drivers of vaccine hesitancy.<sup>13</sup> Confidence denotes trust in the effectiveness and safety of vaccines, the system that administers vaccination, and the motivation of people who decide on the need for vaccination.<sup>17</sup> Complacency is said to occur when perceived risks of vaccine-preventable diseases are low, and vaccination is not considered necessary.<sup>12</sup> Constraints denote structural or psychological barriers to the conversion of vaccination intentions into uptake of vaccination.<sup>13</sup> Risk calculation indicates a deliberate comparison of the risks of infection and vaccination, from which to derive a decision. Individuals who score high in risk calculation perceive higher risks related to vaccination than for the infection.<sup>13</sup> Collective responsibility refers to the willingness to protect others by one's own vaccination, through population immunity.<sup>11</sup> In our research group, we tend to prefer the term "population immunity" or "community immunity" to "herd immunity." Collective responsibility resonates with the African philosophy of Ubuntu;<sup>18</sup> "I am because you are". The 5 C model is based on research predominantly conducted in high-income countries.<sup>13</sup> Research on the scope and determinants of vaccine hesitancy in African countries is still limited; and, the generalizability of this model of vaccine hesitancy to the African context is therefore unclear.<sup>10,19</sup> Given the pervasive nature of vaccine hesitancy, we call for more vaccine hesitancy research in Africa, to help in characterizing the scope and determinants of the phenomenon on the African continent.

The constructs of the 5 C framework (defined above) prioritize individual processes over more social processes.<sup>20</sup> That is the reason why, following a global review of social and behavioral drivers of vaccination, we propose a new theorized understanding of two potential pathways through which different factors might interact to cause vaccine hesitancy, namely, neoliberal logic and social exclusion.<sup>21</sup> Firstly, we observed that many parents in middle- and upper-class settings hold a worldview that health is individualized and healthrelated risks and decisions are matters of individual choice and responsibility. According to this "neoliberal logic", being a good and responsible person in the world means consistently assessing individual health-related risks, seeking and questioning evidence about them, proactively avoiding and managing them, and knowing that one is singularly accountable for the outcomes that ensue. Some parents experienced this worldview as conflicting with vaccination promotion discourses, which provide generalized effectiveness and safety data and advocate for collective responsibility and public health. Parents' perceived tension between these discourses and their underlying worldview led some to delay or refuse vaccination<sup>21</sup>. Secondly, we observed that vaccine hesitancy for some parents is mediated by their experiences of social exclusion. The latter sabotaged trustful government-citizen relations, undermined a climate of social connectedness, and gave rise to a myriad of socioeconomic barriers to good quality vaccination services. These experiences led many marginalized parents to distrust vaccination, to resist vaccination as a form of agency, or to

avoid vaccination due to the time and opportunity costs it poses.<sup>21</sup> We believe that the two concepts, neoliberal logic and social exclusion, provide insights into potential social processes underpinning vaccine hesitancy. Thus, these concepts could be used potentially to complement the core psychological constructs of the 5 C or similar frameworks.<sup>13</sup>

Valid tools to measure the scope and determinants of vaccine hesitancy are essential for the design and evaluation of strategies to prevent and address it.<sup>10,19</sup> Such tools would help identify vaccine hesitancy levels and correlates as well as vaccinehesitant subgroups, thus guiding tactics to address high-risk groups and underlying causes. They can also help with monitoring changes and trends in vaccine hesitancy over time, to detect vaccine concerns early. Given the dynamic and changing nature of vaccine hesitancy, ongoing monitoring is essential. Standardized tools can also enable intra- and inter-country comparisons, and thus support global assessments.<sup>22</sup> In 2018 WHO established the "Measuring Behavioral and Social Drivers of Vaccination" (BeSD) Working Group, a multidisciplinary group of experts and immunization partners globally, to develop tools to understand and measure behavioral and social drivers of vaccination.<sup>23</sup> The BeSD tools measure four domains that play a major role in shaping uptake of vaccines: what people think and feel about vaccines; social processes that drive or inhibit vaccination; individual motivations (or hesitancy) to seek vaccination; and practical factors that shape the experience of seeking and receiving vaccination.<sup>24</sup> Assessing all domains will enable more comprehensive planning and evaluation at country and subnational levels. There is a need to test, validate, and adapt the BeSD tools for application in African countries.

Vaccine hesitancy refers to the unwillingness to receive vaccines when vaccination services are available and accessible. It is pervasive, misinformed, and contagious.<sup>16</sup> African scientists and decisionmakers need to know the scale of the problem in their respective countries so that tailored tactics can be developed to address it and enhance confidence in COVID-19 vaccination, and vaccination in general, on the continent. Such contextualized vaccine hesitancy research is critical for ensuring the effectiveness, efficiency, and equity of vaccination services in Africa. The research should investigate how people think, feel, and act in relation to a vaccine when developing strategies to generate acceptance and uptake for the vaccine. Gathering and using such behavioral and social data will enable programs to design, target, and evaluate interventions to achieve greater impact with more efficiency, and to examine and understand comparable trends over time.

#### Acknowledgments

The authors' work is supported by the South African Medical Research Council and the World Health Organization.

## **Declaration of conflicts of interest**

The authors report no conflict of interest.

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